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10/682,376

10/09/2003

Fraser C. Henderson

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09/22/2004

WILLIAM H. EILBERG

THREE BALA PLAZA

SUITE 501 WEST

BALA CYNWYD, PA 19004

EXAMINER

WALLING, MEAGAN S

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/682,376 | Applicant(s) HENDERSON ET AL. | |
| | Examiner Meagan S Walling | Art Unit 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>03292004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 3, 7, 8, 10, 14, 15, and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Gerard et al. (US 2002/0061126).

Regarding claim 1, Gerard et al. teaches measuring positions of a spinal cord at a plurality of vertebral levels of a patient (see paragraph 4); constructing a plurality of two-dimensional graphs representing cross-sections of the patient's spinal cord at locations corresponding to the plurality of vertebral levels (see paragraph 4); and stacking the plurality of two-dimensional graphs according to the positions measured in step (a) so as to produce a three-dimensional model of at least a portion of the spinal cord (see paragraph 5).

Regarding claim 3, Gerard et al. teaches comparing the three-dimensional model of the spinal cord to data stored in a database, the database containing similar data obtained from other patients (see paragraph 37).

Regarding claim 7, Gerard et al. teaches that the two-dimensional graphs are produced by dividing cross-sections of the spinal cord into a plurality of finite elements, wherein the three-dimensional model produced in step (c) is formed of a plurality of finite elements (see paragraph 5).

Regarding claim 8, Gerard et al. teaches measuring the positions of a spinal cord at a plurality of vertebral levels of a patient (see paragraph 4); constructing a plurality of two-dimensional graphs representing cross-sections of the patient's spinal cord at a plurality of vertical locations, the two-dimensional graphs being assembled from a plurality of finite elements (see paragraph 4), the finite elements being coded according to a neurological function of a region of the spinal cord in which the element is located (see paragraph 25); and stacking the plurality of two-dimensional graphs according to the positions of the spinal cord measured in step (a) so as to produce a three-dimensional model of at least a portion of the spinal cord, wherein the three-dimensional model is made of a plurality of finite elements (see paragraph 5).

Regarding claim 10, Gerard et al. teaches comparing the three-dimensional model with data collected in a similar manner from other patients (see paragraph 37).

Regarding claim 14, Gerard et al. teaches means for measuring positions of a spinal cord at a plurality of vertebral levels of a patient (see paragraph 4); means for constructing a plurality of two-dimensional graphs representing cross-sections of the patient's spinal cord at a plurality of vertical locations (see paragraph 4); and means for stacking the plurality of two-dimensional graphs according to measured positions determined by the measuring means, so as to produce a three-dimensional model of at least a portion of the spinal cord (see paragraph 5).

Regarding claim 15, Gerard et al. teaches means for comparing the three-dimensional model of the spinal cord to data stored in a database, the database containing similar data obtained from other patients (see paragraph 37).

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Regarding claim 18, Gerard et al. teaches means for dividing cross-sections of the spinal cord into a plurality of finite elements, wherein the three-dimensional model is formed of a plurality of finite elements (see paragraph 5).

Regarding claim 19, Gerard et al. teaches means for measuring the positions of a spinal cord at a plurality of vertebral levels of a patient (see paragraph 4); means for constructing a plurality of two-dimensional graphs representing cross-sections of the patient's spinal cord at a plurality of vertical locations, the two-dimensional graphs being assembled from a plurality of finite elements (see paragraph 4), the finite elements being coded according to a neurological function of a region of the spinal cord in which the element is located (see paragraph 25); and means for stacking the plurality of two-dimensional graphs according to the positions of the spinal cord measured in step (a) so as to produce a three-dimensional model of at least a portion of the spinal cord, wherein the three-dimensional model is made of a plurality of finite elements (see paragraph 5).

Regarding claim 20, Gerard et al. teaches means for comparing the three-dimensional model with data collected in a similar manner from other patients (see paragraph 37).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 2, 4, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerard et al. in view of McGregor et al. (US 5,891,060).

Gerard et al. teaches all the limitations of claims 2 and 9 except the limitations of causing the patient to assume each of a plurality of positions, wherein the measuring step is performed for each of the plurality of positions, and wherein steps (a) through (c) are performed for each of the plurality of positions.

Regarding claims 4 and 11, Gerard et al. teaches comparing the three-dimensional models of the spinal cord to data stored in a database, the database containing similar data obtained from other patients (see paragraph 37).

Regarding claims 2 and 9, McGregor et al. teaches making a model of a patient's spine as the patient moves in a series of positions (column 7, lines 5-10).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of McGregor et al. with the teachings of Gerard et al. to perform measuring steps on the patients during a series of movements. The motivation for making this combination would be to diagnose abnormal kinematic functions of the spine (column 1, lines 40-43).

3. Claims 5, 6, 12, 13, 16, 17, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerard et al. in view of Aouni-Ateshian et al. (US 6,161,080).

Gerard et al. teaches all of the limitations of claims 5, 12, 16, and 21 except the limitation of means for simulating a stress applied to at least a portion of the spinal cord, wherein the two-

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dimensional graphs and the three-dimensional model represent the spinal cord in a perturbed condition.

Regarding claims 6, 13, 17, and 22, Gerard et al. teaches comparing the three-dimensional models of the spinal cord to data stored in a database, the database containing similar data obtained from other patients (see paragraph 37).

Regarding claims 5, 12, 16, and 21, Aouni-Ateshian et al. teaches a 3-D joint model that simulates stress on the joints (column 30, lines 17-20).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Aouni-Ateshian et al. with the teachings of Gerard et al. to simulate stress on the spinal cord. The motivation for making this combination would be to determine the effects of different stresses on joints particularly on the spinal cord to assess damage to these areas.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meagan S Walling whose telephone number is (571) 272-2283. The examiner can normally be reached on Monday through Friday 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

msw



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